

## **Satellite Estimation of Fractional Cover in Several California Specialty Crops**

Past research in California and elsewhere has revealed strong relationships between satellite NDVI, photosynthetically active vegetation fraction (Fc), and crop evapotranspiration (ETc). Estimation of ETc can support efficiency of irrigation practice, which enhances water security and may mitigate nitrate leaching. The U.C. Cooperative Extension previously developed the CropManage (CM) web application for evaluation of crop water requirement and irrigation scheduling for several high-value specialty crops. CM currently uses empirical equations to predict daily Fc as a function of crop type, planting date and expected harvest date. The Fc prediction is transformed to fraction of reference ET and combined with reference data from the California Irrigation Management Information System to estimate daily ETc. In the current study, atmospherically-corrected Landsat NDVI data were compared with in-situ Fc estimates on several crops in the Salinas Valley during 2011-2014. The satellite data were observed on day of ground collection or were linearly interpolated across no more than an 8-day revisit period. Results will be presented for lettuce, spinach, celery, broccoli, cauliflower, cabbage, peppers, and strawberry. An application programming interface (API) allows CM and other clients to automatically retrieve NDVI and associated data from NASA's Satellite Irrigation Management Support (SIMS) web service. The SIMS API allows for queries both by individual points or user-defined polygons, and provides data for individual days or annual timeseries. Updates to the CM web app will convert these NDVI data to Fc on a crop-specific basis. The satellite observations are expected to play a support role in Salinas Valley, and may eventually serve as a primary data source as CM is extended to crop systems or regions where Fc is less predictable.

### **Authors**

- [Lee Johnson](#)
  - California State University Monterey Bay
- [Michael Cahn](#)
  - UC Cooperative Extension
- [Carolyn Rosevelt](#)
  - California State University Monterey Bay
- [Alberto Guzman](#)
  - California State University Monterey Bay
- [Tom Lockhart](#)
  - UC Cooperative Extension
- [Barry Farrara](#)
  - UC Cooperative Extension
- [Forrest S Melton](#)
  - California State University Monterey Bay